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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/037,303	11/07/2001	Philipp Harald Nagel	6474	4511

50811 7590 02/22/2007

O'SHEA, GETZ & KOSAKOWSKI, P.C.
1500 MAIN ST.
SUITE 912
SPRINGFIELD, MA 01115

EXAMINER	
TRAN, DALENA	
ART UNIT	PAPER NUMBER
3661	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	02/22/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/037,303	NAGEL, PHILIPP HARALD	
	Examiner	Art Unit	
	Dalena Tran	3661	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *27 November 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *6-8 and 14-16* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *6-8,14-16* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Notice to Applicant(s)

1. This office action is responsive to the amendment filed on 11/27/06. Claims 6-8, and 14-16 are pending.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 6-8, and 14-16, are rejected under 35 U.S.C.103(a) as being unpatentable over Meek et al. (6,366,927) in view of Yamamoto et al. (6,438,494), and Gudat et al. (5,610,815).

As per claims 6 and 14, Meek et al. disclose a vehicle navigation system that receives sensor data from a plurality of sensors, and provides a map image that is presented on a display, system comprising: a navigation map data memory that includes map data indicative of roadways stored geographic features that are other than straight form (see at least the abstract; columns 3-4, lines 20-57; columns 7-8, lines 21-58; figure 10; and column 9, lines 20-64), and a navigation processing unit that receives the sensor data, and requests map data from navigation map data memory associated with the sensor data, and computes the map image from map data (see columns 1-3, lines 13-4; and columns 3-4, lines 21-17). Meek et al. disclose roadways stored geographic features that are other-than-straight form, for example, Bezier curve. Bezier curve is a curve generated by a computable function, represented by polynomial equations. Bezier curves

are defined by control points (column 6, lines 31-32). Also, it is well known that the control points can be manipulated that give the Bezier curve a best-fit for any particular series of shape points used in a As per claims 6 and 14, Meek et al. disclose a vehicle navigation system that receives sensor data from a plurality of sensors, and provides a map image that is presented on a display, system comprising: a navigation map data memory that includes map data indicative of roadways stored geographic features that are other than straight form (see at least the abstract; columns 3-4, lines 20-57; columns 7-8, lines 21-58; figure 10; and column 9, lines 20-64), and a navigation processing unit that receives the sensor data, and requests map data from navigation map data memory associated with the sensor data, and computes the map image from map data (see columns 1-3, lines 13-4; and columns 3-4, lines 21-17).

Meek et al. do not disclose a cornu spiral curve. However, Meek et al. disclose roadways stored geographic features that are other-than-straight form, for example, Bezier curve. straight line segment approximation to a curve in a geographic database, and the Bezier curves can closely approximate circular curve (column 6, lines 35-41). The curving geographic feature is reproduced on the display by drawing straight lines from shape point to shape point starting and ending with the end points (column 4, lines 6-8). Therefore, the control points of the Bezier curves can be manipulated to become a cornu spiral or clothoid curve, because it is well known that cornu spiral or clothoid is a mathematical representation of a transition from a straight line to a curve. And also, it is well known by mathematicians, cornu spiral is a curve also generated by a computable function, as a means of describing the shape of a series of points by a specifying the coefficients of a polynomial equation.

Furthermore, to modify for the teach of Meek et al., Yamamoto et al. disclose Cornu spiral is a clothoid curve, and it is a transition from a straight line to a curve (see column 1, lines 14-23). Meek et al., do not disclose Taylor series. However, Yamamoto et al. disclose terms of polynomials of the clothoid curve (cornu spiral) are stored in the navigation map data memory and the map image is computed using the terms of polynomials of the unit clothoid curve (Cornu spiral) (columns 1-2, lines 53-61), and the polynomials of the unit Cornu spiral are associated with Taylor series expression (columns 2-4, lines 25-21).

In addition, Meek et al., do not disclose the cornu spiral is of the form $l = Ka^2$. However, Yamamoto et al. disclose a clothoid curve (Cornu spiral) is a curve whose curvature is directly proportional to its arc length (see '494, at least column 1, lines 22-23). Also, as current invention, applicant disclose in specification page 4, line 20, parameter value "a = 1". Therefore, equation: $l = Ka^2$, if (a = 1), then $l = K$ (where l is indicative of arc length and K is indicative of curvature), therefore, curvature is directly proportional to its arc length. This is well known as disclose in Yamamoto et al. (column 1, lines 22-23).

Furthermore, to modify for the teach of Meek et al. and Yamamoto et al., Gudat et al. also teach there are other ways to represent other-than-straight road, and a clothoid curve is one of an embodiment of Gudat et al. invention, the motivation is resulting in a highly accurate system for determining position and effecting navigation (see columns 10-11, lines 40-23). Also, Gudat et al. disclose navigation processing unit computes map image using clothoid polynomial coefficients stored in navigation map data memory, and terms

of polynomials of the unit are stored in navigation map data memory and map image is computed using terms of polynomials coefficients (see at least columns 10-11, lines 40-18; columns 31-32, lines 49-49; columns 33-35, lines 54-25; columns 35-37, lines 54-21; and columns 60-61, lines 12-49). As discussed above, Yamamoto et al. disclose Cornu spiral is a clothoid curve, and it is a transition from a straight line to a curve (see Yamamoto et al., column 1, lines 14-23). Therefore, eventhough Gudat et al. do not explicitly disclose "Cornu spiral", but Gudat et al. disclose clothoid curve, therefore clothoid curve is the same as cornu spiral.

It would have been obvious to properly combine Meek et al., Yamamoto et al., and Gudat et al. because, Meek et al. disclose the advantage for storing roadway data to represent other-than-straight road segments is to increase the level of accuracy of the geographic database (see column 6, lines 20-30). Yamamoto et al. disclose to use the curvature transition curves on highly standardized roads, and clothoid curves or cornu spiral curves are usually used as the curvature transition curves (column 1, lines 18-23). Gudat et al. disclose the aspect of the invention is a resulting in a highly accurate system for determining position and effecting navigation, and use of clothoid curve to represent a transition of a path (column 10, lines 48-66). All three references teach storing a roadway data to represent other-than-straight road segments for high level of accuracy. Cornu spiral or clothoid curve is only one of roadway data other than straight road segments.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to implement the teach of Meek et al. by combining geographic features that are other-than-straight form to include a cornu spiral form, for accurately store a different

shapes curvature transition curves represent rivers or curve roads of geographic features, in order to provide a high level of accuracy in the geographic database; also, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the teach of Meek et al. by combining computes map image using Cornu spiral polynomial coefficients stored in navigation map data memory, and terms of polynomials of the unit Cornu spiral are stored in navigation map data memory and map image is computed using terms of polynomials of the unit Cornu spiral associated with Taylor series for accurately determine a Cornu spiral form of roadways and provide an accurate map image; and it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the teach of Meek et al. by combining arc length and curvature form of the cornu spiral to generate curvature transition curves of the roads using the clothoid (cornu spiral) curve.

As per claims 7-8 and 15-16, Meek et al. disclose a vehicle navigation system that receives sensor data from a plurality of sensors, and provides a map image that is presented on a display, system comprising: a navigation map data memory that includes map data indicative of roadways stored geographic features that are other than straight form (see at least the abstract; columns 3-4, lines 20-57; columns 7-8, lines 21-58; figure 10; and column 9, lines 20-64), and a navigation processing unit that receives the sensor data, and requests map data from navigation map data memory associated with the sensor data, and computes the map image from map data (see columns 1-3, lines 13-4; and columns 3-4, lines 21-17). Meek et al. disclose roadways stored geographic features that are other-than-straight form, for example, Bezier curve. Bezier curve is a curve generated by a computable function, represented by polynomial equations. Bezier curves

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Remarks

4. Applicant's amendment filed on 11/27/06 has been fully considered. Upon updated search, and reviewing all the references cited, all references is still considering the relevant art, only except Chojnacki et al. reference is not in this rejection. Therefore, the updated ground of rejection has been set forth as above.

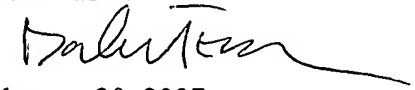
In response to applicant's argue on the remarks of the amendment, eventhough Gudat et al. do not disclose Cornu spiral coefficients. However, Gudat et al. disclose clothoid curves and polynomial coefficients (see at least columns 31-32, lines 38-21; columns 32-33,lines 50-31; and columns 35-36, lines 45-22). Also, Yamamoto et al. disclose clothoid curve is cornu spiral, and all the polynomial coefficients (see at least equation 1-2). Therefore, references cited still reads the claims invention.

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dalena Tran whose telephone number is 571-272-6968. The examiner can normally be reached on M-F 6:30 AM-4:00 PM), off every other Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas Black can be reached on 571-272-6956. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Patent Examiner
Dalena Tran



February 20, 2007